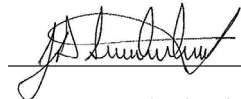

PROVINCIAL FOREST HEALTH STRATEGY, 2013–2016



*Sampling Douglas-fir Beetle in the Kootenay/ Boundary Region
Photo: Art Stock, KBR*

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INTRODUCTION

The provincial government is under increasing pressure to maintain and improve the productivity of British Columbia's forests, extend the supply of the remaining timber resource, and protect other forest resource values as a result of the catastrophic impacts of the mountain pine beetle infestation. Although losses caused by damaging forest health agents (also known as "pests") to forest resources are both natural and expected events, some of these losses are manageable and, in some cases, preventable. Furthermore, the predicted influence of climate change on provincial forests and the threat of invasive pests require rigorous monitoring and risk assessment.

The provincial Forest Health Program's goals represent one of the key objectives of the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO); that is to:

manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia (Ministry of Forests and Range Act, Section 4b)

The Forest Health Program was originally established to "manage pests" by protecting forest resources from bark beetle and defoliating insect damage. Beginning in the late 1970s, management protocols to plan and implement treatment programs were developed that incorporated increasing knowledge on pest and host biology, impacts, and management options. The program has since evolved and expanded to protect and manage British Columbia's forest resources from the impacts of a far wider range of forest health agents. Program activities now centre on the delivery of detection, evaluation, and treatment activities, and the provision of vital client support services.

Where necessary, regional and headquarters program specialists also generate supporting scientific information through directed research projects.

The priorities for the Ministry are outlined in the current Service Plan (<http://www.for.gov.bc.ca/mof/serviceplans.htm>). Initiatives that are relevant to the Forest Health Program include:

Objective 1.2 – The development and use of natural resources are accomplished within the standards set out in the Ministry's legislative and regulatory framework.

Objective 2.1 – Natural Resource productivity is optimized through conservation, stewardship, and effective policy, legislation and external relationships.

This second edition of the *Provincial Forest Health Strategy* identifies three overarching goals¹ that contribute to the provincial forest management framework and direct program investments and resource allocation. Subprograms within each goal are outlined and accompanied by specific objectives and implementation strategies for the period 2013–2016. This strategic direction will be reflected in the forest health strategies of each timber supply area and will guide funding and resource allocation decisions in the Ministry's implementation plans, such as the Land Based Investment Strategy and the Type 4 Silviculture Strategies.

VISION STATEMENT

The provincial Forest Health Program minimizes the negative impacts of forest health agents on the forests of British Columbia.

MISSION STATEMENT

Provide science-based, economically rationalized best management practices and implement treatment programs that prevent or mitigate the impacts of forest health agents.

PROGRAM ORGANIZATION

The Forest Health Program is administered and delivered by staff specialists both at MFLNRO headquarters (Resource Practices Branch) and in the regions, with some involvement by district stewardship staff. Headquarters staff, consisting of the Forest Health Officer, Provincial Forest Pathologist, and Provincial Forest Entomologist, work in the Resource Stewardship Division lead by the Assistant Deputy Minister, Resource Stewardship. The main roles of this Forest Health Unit are to provide provincial-level strategic direction, policy advice, and program oversight. Headquarters specialists also deliver the gypsy moth program and produce the annual summary of provincial forest health conditions. Regional and district staff, who ultimately report to their respective area assistant deputy minister through their regional executive directors, deliver operational programs, monitor local forest health conditions, gather and analyze forest health research data, and provide extension and expert consultative services to local decision makers, industry, and the public. Efficient and co-ordinated delivery of

¹ The Forest Health Program excludes management of established invasive plants, which is currently administered by the Ministry's Range Branch.

forest health activities is achieved through continuous communication and co-operation between all forest health specialists and supporting district staff.

The Forest Health Program currently obtains most of its operational funding through the Land Based Investment Program. In addition, a modest amount of targeted research funding is available to address priority forest health issues. Administrative and salary support is covered through base budgets.

FOREST HEALTH STRATEGIC GOALS

1. *Pest impacts are monitored and assessed*

The evaluation of pest impacts on forest resource values is supported by forest health monitoring and assessments.

2. *Practices are adapted to accommodate known forest health risks*

Forest practices are modified to minimize the impacts of forest health factors based on the best available information.

3. *Resources are protected*

Forest resources are protected from pest damage through appropriately applied direct management actions.

1 *Pest Impacts Are Monitored and Assessed*

A key strategic goal of the provincial Forest Health Program is to conduct impact assessments in support of estimations of volume losses associated with forest health factors. These estimates are then factored into timber supply analyses and other planning processes. Impact assessments also support forest management investment decisions to both mitigate existing losses and minimize future impacts.

Objectives

1. Monitor and provide current data on the impacts of forest health agents on British Columbia's forests.
2. Ensure forest health data is readily accessible to all users (government, industry, academia, and the public).
3. Fully integrate forest health data with other forest management information systems and program areas.
4. Target data collection at priority information needs.

Strategies

- Conduct an annual aerial survey over the majority of the province's forests.
- Address specific knowledge gaps about priority pests, as identified through the timber supply analysis process, in time for the next scheduled Timber Supply Review.
- Continue to publicly distribute standardized annual provincial summaries of forest disturbances and status of major forest health factors.
- Working with Forest Analysis and Inventory Branch, standardize the procedure for calculating non-recoverable losses in each timber supply area.
- Ensure data collected by the provincial Forest Health Program is included in government data repositories, such as RESULTS and the BC Geographic Warehouse, and communicate the availability of this data.
- Maintain or improve the quality of forest health data collected in existing operational surveys (i.e., silviculture surveys, inventory) through increased training, quality assurance monitoring, and maintenance of data quality standards.
- Improve knowledge of forest health data for all forest resource managers through extension and training.
- Collaborate with research staff to ensure forest health trials are maintained within the research trial database, and continue to support the establishment and maintenance of high-priority, long-term forest health research installations.
- Summarize findings from long-term forest health research studies.

2 *Practices Are Adapted to Accommodate Known Forest Health Risks*

Damaging forest health agents can prevent stands from reaching stated management objectives by suppressing growth rates, causing stem deformities, or causing tree mortality, any one of which can result in significant reductions in stand volumes. The provincial Forest Health Program provides science-based practice recommendations (also known as "best practices") to minimize the risk of significant pest damage to managed stands and, to a lesser extent, unmanaged stands.

Best practices information is produced by forest health specialists who synthesize scientific and operational information derived from various monitoring and survey activities, operational and research trials, and peer-reviewed research publications. Some examples are described in Appendix 1. Forest health specialists influence the adoption of new or improved forest health practices through training of field personnel on pest identification and survey methodologies, and through the interpretation of policies, guidelines, and legislation. This information is also communicated through extension events, other training courses, presentations, publications, and policy development. This guidance is a key to the success of professional reliance.

Forest health specialists also recommend adaptations to management practice that account for pest responses to a changing climate.

Objectives

1. Ensure advice on forest health best practices is current, based on best available science, and accessible to all key clients.
2. Continuously improve the proficiency of field staff in pest identification and management.

Strategies

- Interpret and incorporate current science-based knowledge into the body of best practices advice.
- Incorporate stocking standard recommendations related to forest health into district forest health strategies to address locally significant high-risk pests.
- Fully utilize forest health data in RESULTS, from Stand Development Monitoring surveys and other relevant data sources, to adjust and refine best management practices.
- Develop or refine free-growing damage criteria for non-even-aged stand types (mixed wood, deciduous, multistorey).
- Improve the knowledge and skills of field staff in pest identification and management through delivery of timely and accessible training and extension.
- Participate in initiatives outlined in the MFLNRO's Forest Stewardship Action Plan for Climate Change Adaptation.

3 Resources Are Protected

Protection of forest resource values is a key activity of the Forest Health Program. Treatments are applied to limit tree mortality and the impacts of defoliation caused mainly by forest insects. Because treatment programs require significant investments of government resources, careful planning and prioritization is essential. To determine the most effective use of resources, treatment decisions are based on a critical assessment of biological conditions, economic factors, and other considerations.

The highest priority for resource protection is to minimize pest impacts to the current and mid-term timber supply by implementing direct control activities. More recently, treatments are being conducted to protect non-timber resources (e.g., critical caribou and mule deer habitat), as the value of these resources has been documented and factored into treatment rationales. This expansion of the values considered in treatment decisions reflects the Ministry's new broader mandate.

A. Bark Beetle Management

The *Provincial Bark Beetle Management Technical Implementation Guidelines* are used to inform bark beetle investment decisions (see: <http://www.for.gov.bc.ca/hfp/health/fhdata/ProvBBStrategy.pdf>). These guidelines are designed to focus limited resources where direct management can have the greatest impact on beetle populations within areas identified as priorities to protect the current and mid-term timber supply.

The application of suppression activities for mountain pine beetle is currently confined to a few locations in southeastern British Columbia, where opportunities still exist to maintain green lodgepole pine. As the outbreak subsides, areas with significant volumes of mature, unattacked timber have become apparent and may be reconsidered as suitable for a suppression management objective.

Management activities to suppress pre-outbreak populations of Douglas-fir and spruce beetles are being implemented primarily in areas where the co-operative efforts of licensees (including the small-scale salvage program) can be utilized to aggressively treat bark beetle populations across a management unit.

Objectives

1. Focus bark beetle management investments in areas that maximize benefits.
2. Implement policies that encourage industry participation in efficient and effective beetle management.

Strategies

- Phase out the Emergency Bark Beetle Management Area map and replace it with guidelines and processes that allow effective use of existing legislation and policy at the local level.
- Work with the appropriate policy branches to ensure a seamless transition during the Emergency Bark Beetle Management Area phase-out process.
- Continue to apply suppression tactics to high-priority beetle management units, as determined by the provincial beetle management ranking system, to protect current and mid-term timber supply and other resource values.
- Aggressively monitor and manage Douglas-fir and spruce beetles, particularly in timber supply areas heavily affected by mountain pine beetle, to mitigate impacts on both timber and non-timber resource values.

B. Defoliator Management

Treatment of defoliating insects reduces the growth loss, top kill, and mortality associated with defoliation. British Columbia's forests are damaged by a diverse array of defoliator species. Despite this diversity, operational treatment programs are only implemented for western spruce budworm, Douglas-fir tussock moth, and western hemlock looper. Other potentially significant defoliators, which may warrant treatment in the near future, include 2-year-cycle budworm and blackheaded budworm.

Objectives

1. Protect critical current and mid-term timber supply through implementation of targeted defoliator treatment programs in areas heavily impacted by mountain pine beetle.
2. Protect public health and forest resource values by reducing Douglas-fir tussock moth populations on Crown land.
3. Protect habitat deemed critical for caribou survival by MFLNRO and Ministry of Environment wildlife habitat specialists through reductions in tree mortality caused by western hemlock looper.
4. Continuously improve treatment methods, stand selection criteria, damage thresholds, and return on investment for:
 - a. Western spruce budworm as it expands into new geographic areas (Quesnel)
 - b. 2-year-cycle budworm in subalpine fir–spruce stands

c. Western hemlock looper

d. Blackheaded budworm

Strategies

- Within timber supply areas impacted by the mountain pine beetle, target all high-priority western spruce budworm areas for treatment with Btk.
- Develop operational treatment criteria and define optimal timing of Btk applications for 2-year-cycle budworm in high-elevation stands.
- Adapt treatment criteria for western spruce budworm where it has expanded into new geographic areas.
- Using targeted aerial and ground surveys, continue to monitor other potentially important defoliator populations to allow a rapid response to emerging outbreaks.
- Secure a commercial supply of Douglas-fir tussock moth virus in preparation for the next outbreak (estimated to be as early as 2019).

C. Management of Exotic Pests

British Columbia is under continuous threat from invasive non-native pests. Responsibility for the detection, treatment, and regulation of exotic species lies with the federal government's Canadian Food Inspection Agency. Once an invasive species is declared established, this agency generally limits its resource commitments to regulations that address trade implications, deferring active pest management to the provinces or other jurisdictions. When this decision is made, the provincial Forest Health Program conducts a risk analysis that determines the best course of action to minimize the pest's impact.

Objectives

1. Maintain British Columbia's gypsy moth-free status.
2. Plan and co-ordinate activities with federal and provincial partners to facilitate a timely and effective plant health emergency response.
3. Prevent the establishment of invasive species of concern currently found in other parts of Canada.

Strategies

- Continue to work collaboratively with the Canadian Food Inspection Agency, Canadian Forest Service, B.C. Ministry of Agriculture, and B.C. Ministry of Environment on gypsy moth monitoring and eradication programs.

- *Continue active participation in the British Columbia Plant Pest Advisory Committee and the Critical Plant Pest Committee, the latter committee being a multi-agency body specifically tasked with co-ordinating responses to plant health emergencies.*
- *Complete the *Septoria musiva* risk analysis that will evaluate the threat and risk mitigation response options for protecting hybrid poplar plantations.*
- *Participate in Tree Improvement Program trials for breeding resistance to white pine blister rust.*

SUMMARY

Government has a mandate to protect the economy, the environment, and the capacity of our land resources from the negative impacts of damaging forest health agents. The Province of British Columbia has worked diligently to achieve this mandate through legislation, policy, procedures, targeted funding, and education. The *Provincial Forest Health Strategy* builds on this

foundation and lays out a framework of environmentally sustainable prevention and management activities.

This strategy commits the Forest Health Program to:

- Build on the strengths of existing partnerships, thereby aligning resources, policy, and information, and to explore and establish new partnerships
- Maintain and expand on the capacity to monitor and detect forest health agents
- Deliver treatment programs to mitigate damaging forest health agents
- Facilitate forest health knowledge through training and education
- Implement science-based prioritization of forest health agents for planning and decision making that uses the best available information
- Regularly report on forest health issues, actions, and outcomes

APPENDIX 1 EXAMPLES OF FOREST HEALTH ADVICE THAT INFLUENCES SPECIFIC FOREST MANAGEMENT ACTIVITIES.

Practice Information	Purpose	Information Source
Stocking standards	Provide forest health information related to species, density, and minimum heights that will minimize risks from pests which seriously affect stand yield. Provide guidance to delegated decision makers on forest stewardship plan stocking standard approvals.	<i>Stocking Standard Forest Health Test Guidance to Delegated Decision Makers</i> (http://www.for.gov.bc.ca/hfp/silviculture/Guidance for assessing FSP stocking standards June 21 2012.pdf). District forest health strategies will be the source of TSA-specific stocking standard recommendations designed to accommodate potential forest health risks.
Free-growing damage criteria and data submission standards	Provide specific criteria to define acceptability of free-growing stems. Also, provide recommendations regarding the acceptable quality of forest health data to be entered into RESULTS.	Existing criteria in place for even-aged stands, multi-layered stands, broadleaves, and for use in stand development monitoring. Updates are ongoing for the broadleaf criteria. Free-growing damage criteria (http://www.for.gov.bc.ca/hfp/silviculture/Silviculture_Surveys.html).
Stand tending guidelines	Provide damage thresholds to determine acceptability of stands for incremental silvicultural investment.	Existing guidelines need continual update based on activity of mountain pine beetle and other forest health agents.
Application of pest-resistant seed	Set guidelines for the use of seed bred for resistance to a specific pest.	Currently available for Class A seed bred for resistance to spruce weevil and white pine blister rust damage.
Root disease, stem rust and mistletoe management guidelines	Guide use of practices to reduce the potential impact of diseases.	Forest Practices Code guidebook and Stand Establishment Decision Aids; appraisal manuals.
Landscape-level species selection advice	Guide deployment of tree species appropriately across a landscape to meet landscape-level objectives and to prepare for the potential impacts of climate change.	Referenced on the Tree Species Selection website (http://www.for.gov.bc.ca/hfp/silviculture/TSS.htm).
Dothistroma guidelines (Forest Planning and Practices Regulation, Section 96)	Identify areas where pine planting should be minimized due to Dothistroma hazard. Define areas where licensees may claim relief if stands are not free-growing because of Dothistroma.	FORREX's Stand Establishment Decision Aids are available, with ongoing updates (http://www.forrex.org/stand-establishment-decision-aids-sedas).